

Kyle (D. B.)

PHENATE OR CARBOLATE OF COCAINE

AS A

LOCAL ANÆSTHETIC.

BY

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Phenate or Carbolate of Cocaine as a Local Anæsthetic.

THE need of a good local anæsthetic from which there is no danger of oversystemic action has long been felt by the medical profession.

Probably no better drug than the muriate of cocaine has been produced, but it is open to the one serious objection that when applied to cut surfaces it produces dangerous systemic action, endangering the life of the patient, and in a limited number of cases causing death.

Believing the combination of carbolic acid and cocaine to be an excellent one theoretically, from the fact of both possessing anæsthetic properties, and the former one of the best known antiseptics, the writer decided to test the practical use of the drug.

The phenate of cocaine is one of the many preparations by Merck. It is described as a slightly-colored substance, of the consistence of thick honey, which readily melts when heated, and containing seventy-five per cent. of the cocaine alkaloid.

It is soluble in alcohol of from thirty to fifty per cent., the solution having a faint odor of carbolic acid.

The dose of the drug is from $\frac{1}{2}$ to $\frac{1}{6}$ grain,



repeated every four hours. Locally, it is applied in solutions varying from one to ten per cent.

How much the antiseptic properties of the carbolic acid are affected by the chemical combination we leave open for discussion, suffice to say that the solution was applied to cut surfaces in which no other antiseptic was used, and in all cases the results were equally as good as in those where such solutions as peroxide of hydrogen or carbolized benzoninol were used.

As to the antiseptic properties, some few tests have been completed and others are being carried on.

These tests confirm the statement that the combination still possesses antiseptic properties, but not equal to the carbolic acid alone.

It is the writer's belief that it at least retards the growth of micro-organisms.

As a local anaesthetic, the power of cocaine is very great over limited areas. This is especially true when applied to mucous membranes. Applied to such structures as the Schneiderian membrane, the mucous covering of the glans penis, or by hypodermic injection, it causes limited blood-supply by contraction, and produces temporary anaesthesia.

If applied to the tongue, it temporarily perverts both taste and tactile sensibility. Applied to the ocular conjunctiva, it not only produces profound anaesthesia of this membrane, but causes dilatation of the pupil, partial paralysis of accommodation, enlargement of the palpebral fissure, slight lachrymation, and often temporary ptosis.

The physiological action of the phenate of

cocaine is practically the same, at least as far as the writer has been able to test.

It might be best to state that the writer's experience with the drug has been limited exclusively to throat and nose work.

In testing its anæsthetic properties, ten different solutions were used, ranging in strength from one to ten per cent., the six- and eight-per-cent. solutions answering as well for all operations as the nine and ten. The applications were limited to the nasal and pharyngeal mucous membrane.

For thermo-cautery application in follicular or granular pharyngitis, where the burning is superficial, the two- to four-per-cent. solution gave equally as good results as the higher ones. The one- and two-per-cent. solutions were not satisfactory ; for prolonged operations and those involving deeper tissue the stronger solutions must be used.

As a local anæsthetic, I have used the drug in twenty-four separate cases, as follows : Four cases when removing the hypertrophied inferior turbinated bone by means of saw and cautery snare ; two cases of exostosis of septum removed by saw and knife ; five cases of enlarged tonsils reduced by thermo-cautery ; three cases of follicular pharyngitis treated by puncture with cautery needle ; two of adenoid vegetations at the vault of the pharynx treated by flat, curved cautery-blade ; three cases of hypertrophic rhinitis ; one case of hay fever, on which I operated for hypertrophied turbinated bone ; and four cases of nasal polypi.

In each of these cases I kept a record of the number of times applied and length of time before anæsthesia was produced.

Various theories are advanced as to how phenate of cocaine acts, whether by the paralyzing of the terminal twigs of the sensory nerves, or by vaso-motor action, rendering the nerves bloodless, and thereby rendering them unable to transmit sensory impressions.

However, this we will leave each to his own belief ; we know it acts as a local anaesthetic.

Combined with the aqueous extract of witch-hazel, it is an admirable astringent not only in hemorrhage but in acute catarrh.

In one case of exostosis of the septum and two of hypertrophied turbinated bone, the anaesthesia was not satisfactory, as is usually the case when cutting of the bone or where deep tissue is involved ; the same can be said of the muriate of cocaine.

The length of time to produce anaesthesia is somewhat longer than that required for the muriate ; but, when once produced, it is more lasting. In the twenty-four cases reported, the average time was seven minutes, the total number of applications at different sittings being one hundred and fifty.

The astringent properties of cocaine are well known.

Having used the aqueous extract of witch-hazel with success in cases of nasal hemorrhage, I used this in making the test solutions.

As the phenate of cocaine is insoluble in the witch-hazel, I first dissolved it in alcohol, then added this to the witch-hazel.

An equally good combination is phenate of cocaine thirty grains, menthol fifteen grains, to one ounce of witch-hazel. This is, however, open to the objection of the bad after-effects of menthol, first causing contraction of the

blood-vessels, which is afterwards followed by congestion, with decided irritation of the mucous membrane.

In comparing the phenate with the muriate of cocaine, I believe it to be as good a local anæsthetic, and in none of the one hundred and fifty applications of which I kept record, and I feel safe in saying as many more of which I kept no record, did I have symptoms of cocaine-poisoning, nor did the patient complain of any bad after-effect.

Yet in three cases there was cardiac disease and in one albuminuria. These conditions are known to be especial contraindications for the use of the muriate.

As an antiseptic, I believe it equal to any carbolized solution usually used in nasal operations.

It can be safely used on cut surfaces, which, in using the muriate, is to be carefully avoided.

It is superior to the muriate in the fact "that it coagulates the albumin in the tissue, preventing the absorption of the cocaine, thereby prolonging the anæsthetic effect, and lessening the danger of systemic poisoning" (Hare).

Dr. Isador Gluck has for several years added carbolic acid to solution of muriate of cocaine for the purpose of avoiding the after poisonous effects.

Dr. Roberts Bartholow also states that phenol added to muriate of cocaine will lessen the danger of systemic poisoning.

Dr. Von Oefele uses the drug exclusively in the place of the muriate, locally, internally, hypodermically, and in powder.

For operations involving the deeper tissue, the drug must be used hypodermically, the eight-per-cent. solution usually producing suffi-

cient anaesthesia. The alcoholic solutions give better results, but are more irritating.

While we must not draw too positive conclusions from these few cases reported, yet the results are such as to justify its use in minor surgery.

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